

Customer Service Program (CSP)

Service Market
Analysis

Third-Party
Maintenance

INPUT®

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D E C E M B E R 1 9 8 7

THIRD-PARTY MAINTENANCE MARKET ANALYSIS

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Abstract

The 1987 *Third-Party Maintenance Market Analysis* provides an extensive overview of the current and projected size and composition of the TPM marketplace. As well as providing hard dollar-figures in its analysis, the report also discusses a number of important transformations the competitive marketplace has undergone in 1987, both internally and as a result of increasing pressure from manufacturer competition and user demands.

The report is organized into three main sections, each approaching the TPM market from a slightly different perspective:

- Chapter III presents quantified market-size and growth forecasts for each product sector for 1987 to 1992; in addition to the total customer service market discussion, both the third- and fourth-party markets are broken out and analyzed individually. Additionally, the TPM market is broken down into specific service sectors, and analyzed for current and future potential. The leading vendors from these markets are then ranked and discussed in Chapter III.
- Chapter IV delves into the industry issues which have brought the market to its current state, including a discussion of users' perceptions of service vendor performance, and the issues affecting their choice between "second-" and third-party sources. Major competitive moves by IBM in 1987, including the CSA/MRSA discount plans are also discussed, as well IBM's and other players' strategies in terms of parts provision, and warranty lengths. A separate section deals with continuing consolidation of the TPM marketplace, identifying and analyzing the major acquisition moves made in 1987.

- Chapter V provides readers with an overview of the many forces acting on the TPM marketplace, and offers third-party contenders a number of specific recommendations for action within the increasingly competitive service market environment.

The introduction to the report information (Chapter I) and the executive overview (Chapter II) sections are provided to allow the busy reader to quickly assimilate the major points made within the text of the report. Exhibits presented in Chapter II are prepared to facilitate the use of the summary information in in-house slide/over-head foil presentations.

The entire report contains 46 pages, including 24 exhibits.

Table of Contents

I	Introduction	1
<hr/>		
II	Executive Overview	3
	A. Third-Party Maintenance Market Size	4
	B. TPM Market Leaders	6
	C. Major Issue of 1987: IBM's CSA	7
	D. An Aggressive New IBM	8
<hr/>		
III	TPM Market Size and Forecast, 1987-1992	11
	A. Overall Customer Service Market Size and Forecast	11
	1. Current Market	11
	2. Market Forecast	14
	B. TPM Market Size and Forecast by Product Type	18
	1. Current Market Size	18
	2. TPM Market Forecast	21
	3. TPM Market Forecast by Product Sector	24
	4. "Hard" and "Soft" TPM Service Market Forecast	28
	C. The "Fourth-Party" Maintenance Market	30
	D. The Top 20 Players in the Third-Party Marketplace	32
<hr/>		
IV	The Third-Party Maintenance Industry	37
	A. TPM versus Manufacturer Maintenance Performance	37
	B. The Impact of IBM's Corporate Service Amendment	38
	C. Spare Parts Issues in the TPM Industry	40
	D. Extended Warranties and Their Effect on the Market	41
	E. Third-Party Mergers and Acquisitions in 1987	43

Table of Contents (Continued)

V	Recommendations and Conclusions	45
A	Appendix: Definitions	47

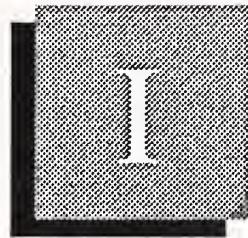
Exhibits

II	-1	TPM Market Growth 1987-1992	5
	-2	TPM Market Leaders 1987	6
	-3	Key Service Issue of 1987: IBM's CSA Announcement	7
	-4	IBM's Aggressive New Stance	9
 III	 -1	1987 Customer Service User Expenditures	12
	-2	1987 Customer Service Product Market Share	14
	-3	1992 Customer Service Product Market Share	15
	-4	Customer Service User Expenditures 1987-1992	16
	-5	Customer Service User Expenditures Growth 1987-1992	17
	-6	TPM Share of Total Customer Service Market 1987	19
	-7	1987 TPM Product Market Share	20
	-8	TPM User Expenditures 1987-1992	21
	-9	1992 TPM Product Market Share	25
	-10	TPM User Expenditures Growth 1987-1992	26
	-11	TPM Share of Total Customer Service Market 1992	27
	-12	TPM "Soft" Services 1987-1992	29
	-13	TPM "Hard" Services 1987-1992	30
	-14	"Fourth-Party" Maintenance Markets 1987-1992	31
	-15	TPM Market Leaders	33
 IV	 -1	TPM versus Manufacturer Service Performance	38
	-2	Impact of IBM's Corporate Service Amendment	39
	-3	Spare Parts Pressures Intensify	40
	-4	1987 Warranty Term Changes	41
	-5	1987 TPM Acquisitions	44



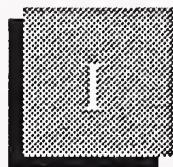
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Introduction

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Introduction

The history of the third-party maintenance market, although a relatively short one, has been rife with change, and the past year has certainly been no exception. As the TPM market has evolved from a small and largely ignored sector of the total support marketplace in its early years, the growing success of the industry in recent years has spurred increasing competitive reaction from all sides.

1987 has been marked by increasing recognition of TPM as a real and present threat to manufacturers' service revenues, inciting a number of market leaders (including the previously complacent IBM) to launch what many see as a direct attack on the TPM industry. Although most manufacturer organizations deny that the new strategies were borne of an intent to reduce third-party leverage within their customer base, the fact remains that a number of manufacturer-driven changes that have occurred in the TPM market this year will have far-reaching effects on the competition.

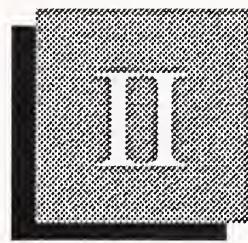
This report attempts to put these and other changes in the marketplace into perspective, and interpret their effect on to the future of the third-party market. A variety of competitive developments are discussed in terms of their effect on the market environment, including recent increases in standard warranty offerings, and the contention between manufacturers and TPMs over spare parts, as well as the rash of IBM service policy changes made in 1987.

Increasing competition between equipment and third-party support vendors for a common customer base has transformed service into a "buyers' marketplace," allowing users at all levels to increase their support requirements. These increasing pressures from the user side are also analyzed within the report, including a look at users' perceptions of manufacturer-supplied support and third-party service.

Mergers and acquisitions continue to play an equally important role in the composition of, and competition in, the TPM market. An up-to-date ranking of the leading third-party players is provided within the report, along with a section devoted to identifying and analyzing the most important acquisition moves made in 1987 in the competitive market-place.

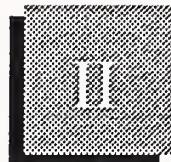
The results of these pressures on the overall service market and its third-party sector are quantified in our analysis of the current and projected sizes of these two markets. Providing a forecast of the marketplace from 1987 to 1992, the report discusses present and future market potential within the large-mainframe, small-system, microcomputer, and peripheral sectors, as well as the growing "fourth-party" market.

Using information gathered from the nearly 1500 user and vendor interviews INPUT has conducted in the service industry this year, the *Third-Party Maintenance Market Analysis* report provides a well-supported overview of the third-party arena in terms of its size and future direction, the changing balance within the TPM market sectors, and current industry issues at work in the marketplace. To conclude the report, a number of summary points and specific recommendations are made for competitors in the changing market.



Executive Overview

1



Executive Overview

This section of the *Third-Party Maintenance Market Analysis* is designed to present the major findings of the report in an efficient overview format. Each Exhibit illustrates a key point revealed by this year's research, and the accompanying text outlines its significance to the third-party maintenance marketplace.

INPUT has been tracking the third-party maintenance industry since 1984 when TPM was still in its formative years, and the evolution of the successful service sector has been a rapid one. Consolidation of the once largely fragmented market has contributed greatly to the increased visibility of TPM from the standpoint of the user, as well as of the processing industry overall.

This success, however, has been a two-edged sword. While allowing a number of third-party leaders to rise to prominence in the service industry, the success of the TPM alternative has also recently wrought considerable attention from the manufacturer competition. Because third-parties now hold nearly \$2 billion of equipment vendors' service revenues, manufacturers are no longer standing idly by while TPMs woo their customer base. The competitive climate of the TPM industry has suddenly heated up, and third-parties are busily preparing themselves for the long storm ahead.

A

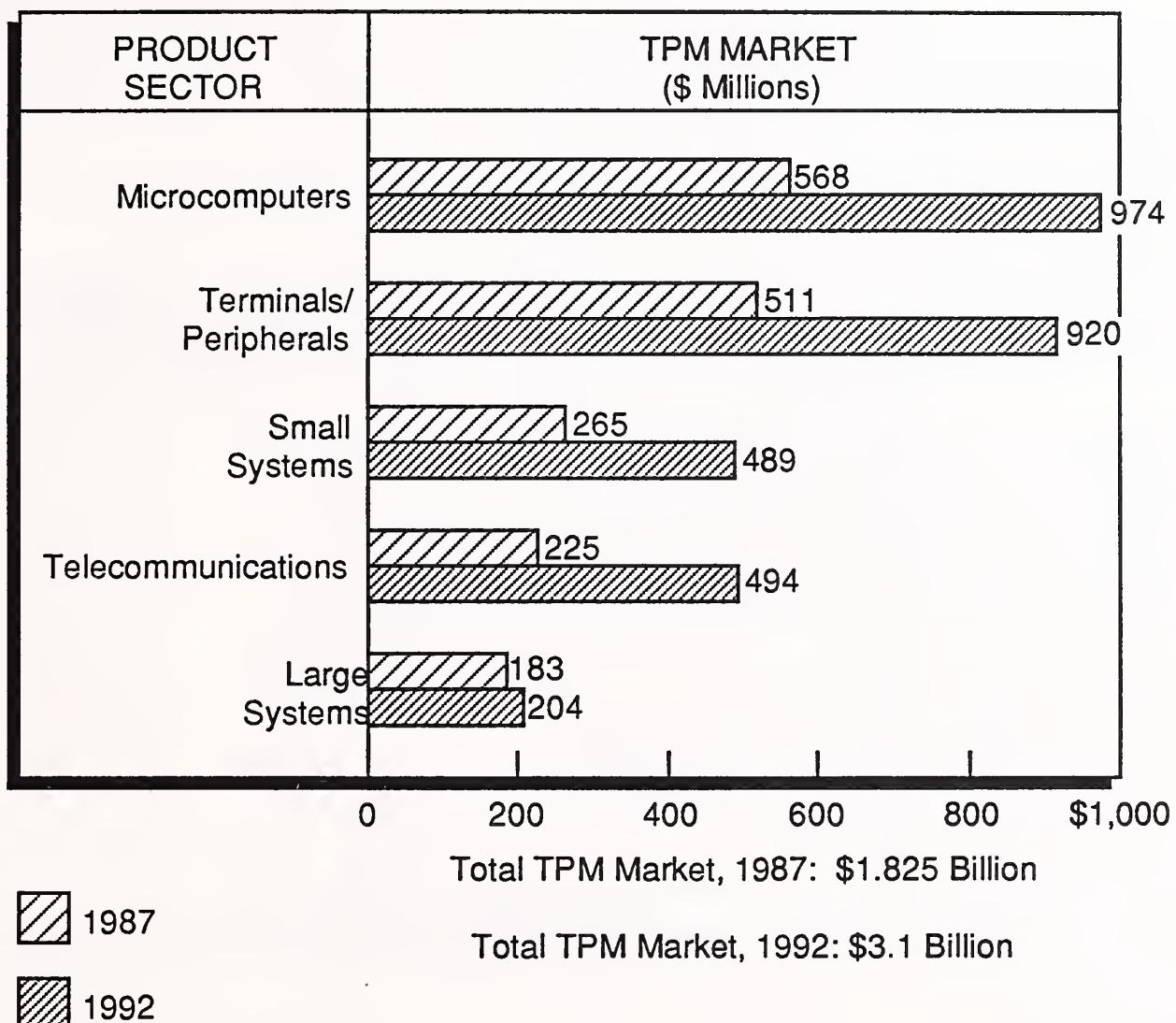
Third-Party
Maintenance
Market Size

The third-party market has shown growth in excess of \$1 billion over the past five years, and is now a considerable force within the customer service marketplace as a \$1.8-billion-dollar industry. Although a number of newly introduced competitive factors have somewhat tamed earlier estimates for TPM growth into 1992, INPUT expects third-party vendors to have captured a total of \$3.1 billion in annual support revenues within five years. Despite the slight downward adjustment, this number still represents a nearly fourfold growth of the third-party market size in only ten years.

Although TPMs have entered into the service industry via the microcomputer and peripherals sectors, the third-party market is still dominated by revenues made within these two product segments, as illustrated in Exhibit II-1. This concentration of revenues among these lower-end products is expected to carry through the forecast period, with micro and peripheral services still accounting for 60% of the 1992 total TPM marketplace.

Although these product markets are obviously significant to third-party growth, even more important is the profitable systems marketplace, with the burgeoning small systems network sector supplying TPMs with even greater growth potential over the next five years. The rise of the networked minicomputer systems environment will carry with it the need for expanded telecommunications support, and these two interrelated market sectors are expected to experience five-year growth periods exceeding even those of micro and peripheral support segments. In telecommunications services, third-party support is expected to grow by 17% into 1992, contributing significantly to the overall growth of 12% forecast for the market as a whole.

EXHIBIT II-1

**TPM MARKET GROWTH
1987-1992**

B**TPM Market Leaders**

Further market consolidation has left fewer, but stronger third-party players to compete for this total TPM market share. As competition heats up within the service marketplace, smaller, less financially secure firms are dropping out of the market or being added to the resource base of the large TPM players. With third-party market leaders like TRW and Sorbus cornering annual service revenues in the quarter-billion-dollar range each, market share continues to accumulate at the top of the TPM rankings, as evidenced in Exhibit II-2.

EXHIBIT II-2**TPM MARKET LEADERS
1987**

RANK	VENDOR	1986 TPM REVENUES (\$ Millions)	MARKET SHARE (Percent)
1	TRW	250	16
2	SORBUS	240	15
3	General Electric	180	12
4	Intelogic Trace	156	10
5	Control Data Corporation	110	7

With the powerful financial backing enjoyed by all of these leading five TPM organizations, a good deal of the growth of each firm has been through an ongoing and aggressive acquisition strategy. Although major reorganization efforts distracted both GE Computer Services and CDC's Technical Service Division over 1987, the remaining three firms were all active in acquisition over the past year, despite a difficult fiscal year industry-wide. Leading the activity was Sorbus, which, through its well-heeled Bell Atlantic parent company, consummated the purchase of four third-party firms in 1987, adding significantly to its competitive resources.

The ability of TPM leaders of this caliber to quickly expand their operations and revenue base through acquisition has drastically altered the composition of the TPM market in recent years. The TPM industry is now largely dominated by these top five players, who share a total of 60% of the entire third-party marketplace between them.

C

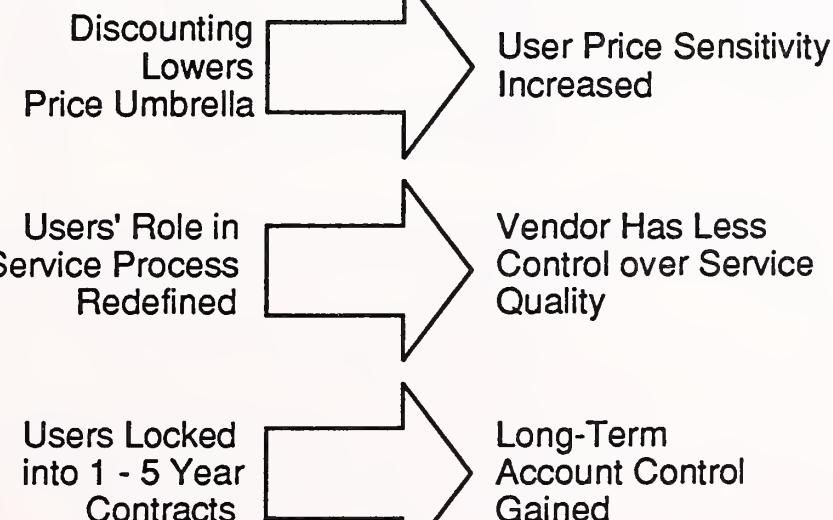
Major Issue of 1987: IBM's CSA

The year 1987, marked by the adoption of "the Year of the Customer" theme by market leader IBM, proved to be a troublesome year for the third-party competitive marketplace. Introducing a steady stream of service policy changes kicked off by the Corporate Service Amendment (CSA) in late '86, IBM took a drastic strategic turn in 1987 in efforts to regain hold on slipping service revenues as hardware profitability continued to decline. Many other manufacturers are facing the same shift in revenue balance and, following IBM's lead, are likewise strengthening their competitive stances in defense of their eroding support revenues.

Whether or not intended to directly wound third-party competition, IBM's new service strategy represented by the CSA has sent the TPM industry reeling. Offering discounts as high as 45% on IBM-supplied support, and providing standard coverage over 24 hours 365 days a year, the CSA signified a new era for IBM, and its competition. Exhibit II-3 illustrates the impact of CSA.

EXHIBIT II-3

KEY SERVICE ISSUE OF 1987: IBM'S CSA ANNOUNCEMENT



Later announcements removed restrictive clauses from the original CSA, and added a midrange sister agreement to the plan. Following the CSA standard, the 24 hour/7 day coverage was extended to include all systems, options, and peripherals at 11-hour/5-day prices. Numerous price cuts, warranty extensions and noncontract resource withdrawals (including time and materials availability and parts distribution centers) were sprung on the industry, all serving to severely tighten competition for IBM users' service dollar.

IBM's "year of the customer" signaled the awakening of the "sleeping giant" that is no longer willing to stand idly by while the largely IBM-based TPM market profits. Hitting much of the market by surprise, the impact of the CSA and other 1987 announcements will undoubtedly effect the health of the third-party maintenance market for many years to come.

D

An Aggressive New IBM

Along with the Corporate Service Amendment (CSA) discussed in the previous section, and the companion Mid-Range Systems Amendment (MRSA) that offered similar discounts to users of IBM small systems, IBM announced a number of key service policy changes that clearly demonstrate IBM's intention to step up the battle to regain and even attract new customers to IBM service offerings.

In September of 1987, IBM announced that it was reducing the number of locations where users and other service organizations could purchase spare parts from 100 locations to only 21. In addition, IBM added emergency parts charges for rush and off-hour parts requests. This move benefits IBM by increasing the spares inventories at each center (thus reducing costs as well as increasing the likelihood of finding a part) as well improving IBM's control over spares by reducing the number of sources.

In November, IBM announced that it was expanding the basic period of coverage for all contract customers (excluding those who did not already qualify for optional periods of coverage) to seven-day, twenty-four-hour coverage. Those contract customers that opted for additional periods of coverage would receive credit for their premiums. Although this move was not altogether unexpected (IBM already provided around-the-clock coverage to their CSA and MRSA discount customers), the move makes IBM contract pricing all the more attractive to price-conscious users.

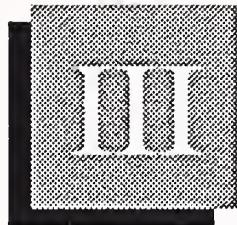
At the same time, IBM announced it was eliminating time-and-materials coverage to noncontract customers outside of the prime (7 AM to 6 PM local time) shift. While stating that this move was made to better dedicate resources to properly meet the needs of contract customers, this move will have greatest effect on servicing agents – e.g., leasing companies, service brokers, and small TPMs that rely on IBM T&M coverage to service their own customers. Hardest hit will be service brokers and leasing companies that based a major part of their appeal on the fact that users would always get IBM service, although small TPMs will also be hurt by the absence of IBM to cover remotely located customers. Now these companies will have to team up with other TPMs to provide after-hours service.

Exhibit II-4 summarizes the changes at IBM.

EXHIBIT II-4

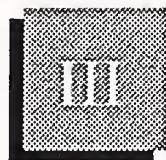
IBM'S AGGRESSIVE NEW STANCE

- CSA/MRSA Discounts
- Tightened Spares Pipeline
- Eliminated Nonprime T & M
- Expanded Coverages



TPM Market Size and Forecast, 1987-1992

1987 1988 1989 1990 1991 1992



TPM Market Size and Forecast, 1987-1992

A

Overall Customer Service Market Size and Forecast

1. Current Market

The customer services market has taken on a much higher profile in recent years, as the once-burgeoning information processing marketplace settles into a slimmer stage of its life cycle. Being recognized as both a direct source of potential profit, as well as a marketable feature in product sales, the industry is turning more attention to its customer services business as hardware margin growth continues to slump. Revenues gained from services are continuing to outstrip new shipments in the industry, and customer services has grown to a \$17.2 billion marketplace in 1987, as shown in Exhibit III-1.

Within this growing market, the support of systems peripherals has emerged as the leading revenue generator in 1987, surpassing even the high-margin maintenance of large-systems service for the first time over this past year. Now accounting for \$5.1 billion of the past year's market, the growth of terminal and peripheral service will continue as users' preferences turn away from purchasing an entire up-scaled system, to more economical upgrades of their memory and processing power through add-on peripheral products.

Technological advances, as well as encouragement from the vendors of smaller systems and components, have provided the user marketplace with the ability to enlarge its systems as its needs grow. Smaller systems with the flexibility to add and subtract less-expensive component units are becoming increasingly attractive to users attempting to control their processing budgets.

EXHIBIT III-1

**1987 CUSTOMER SERVICE
USER EXPENDITURES***

PRODUCT SECTOR	\$ BILLIONS
Large Systems	4.6
Small Systems	3.3
Microcomputer	1.7
Telecommunications	1.5
Terminals/Peripherals	5.1
Other (WP, Workstations)	1.0
Total	17.2

*Excluding user self maintenance and special-purpose systems.

The rapid growth of the small systems and peripherals service market over the past year also reflects this migration away from large-systems ownership, with small-systems support now contributing \$3.3 billion to the customer services market total (Exhibit III-1). The small-systems service market was up 18% from its 1986 total, and both small systems and peripherals support showed growth well exceeding the large-systems contribution (up only 7% from the '86 total of \$4.3 billion).

Despite this considerable growth experienced in the small-systems market, large-systems service revenues still account for a major share of total customer service expenditures. As natural function of the mainframes' greater complexity and higher price per unit, large-systems service revenues, although growing at a slower rate, remained a higher dollar figure contributor to the total market size at \$4.6 billion.

Although accounting for a much smaller portion of the entire customer services marketplace, microcomputer support took a significant leap in 1987, reflecting the good year micro manufacturers had for system

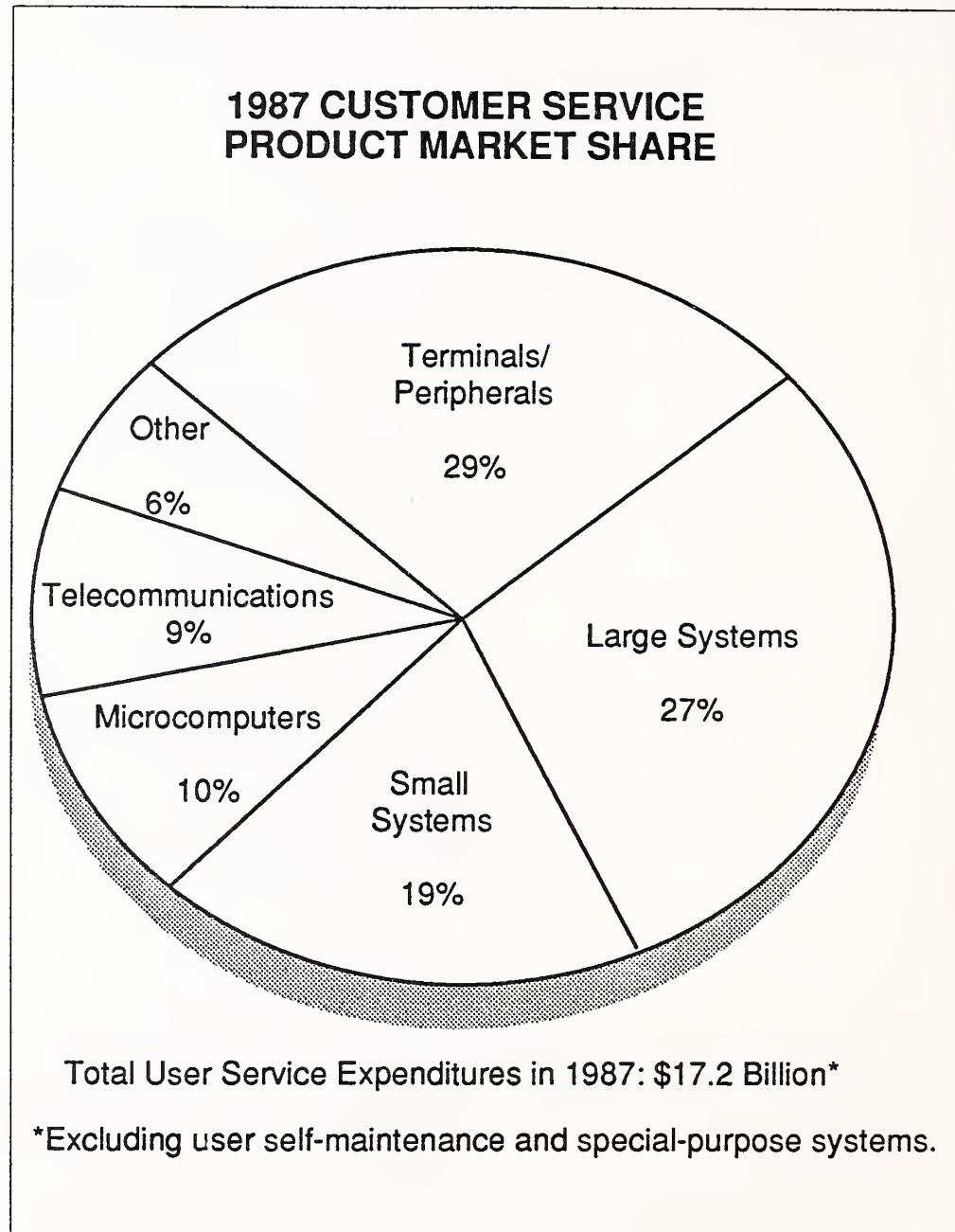
shipments. Up now to a total of \$1.5 billion, the growing capabilities of these once-limited "PC" systems are supporting their increased use in more-critical applications, in turn increasing the need for service coverage on the systems.

The push toward networked systems has also contributed somewhat to the increases seen in micro support revenues, but has yet to have the impact many have predicted. The increasing interconnection of telecommunications products and information processing equipment encouraged by this new network technology, however, has introduced a greater need for telecommunications support within the computer service industry. Spurring a 15% growth rate over the past year, telecommunications support now accounts for nearly as great a share as that of the entire microcomputer support market, which reached \$1.7 billion in 1987.

As illustrated in Exhibit III-2, these two smaller product sectors (telecomm and micro) are growing not only in absolute size, but also in terms of market share. Gaining share from the two majority shareholders (the large-system and terminal/peripheral markets), these two sectors increased their hold on the market from their 1986 percentages of 8% and 7% of total market size, respectively. Although telecommunications support holds considerable promise for future growth, the micro sector is not considered an extremely attractive marketplace, despite the increased corporate usage of micro products.

Poor per-unit margins will continue to restrict the growth potential of these micro systems as competition from the "clone" manufacturers continues to drive prices down, leaving little room for margin in related service pricing. Lower hardware pricing also increases users' price-sensitivity to support coverage costs and, combined with the product dispersion common for installed micros, makes the chances for profiting at micro support slim.

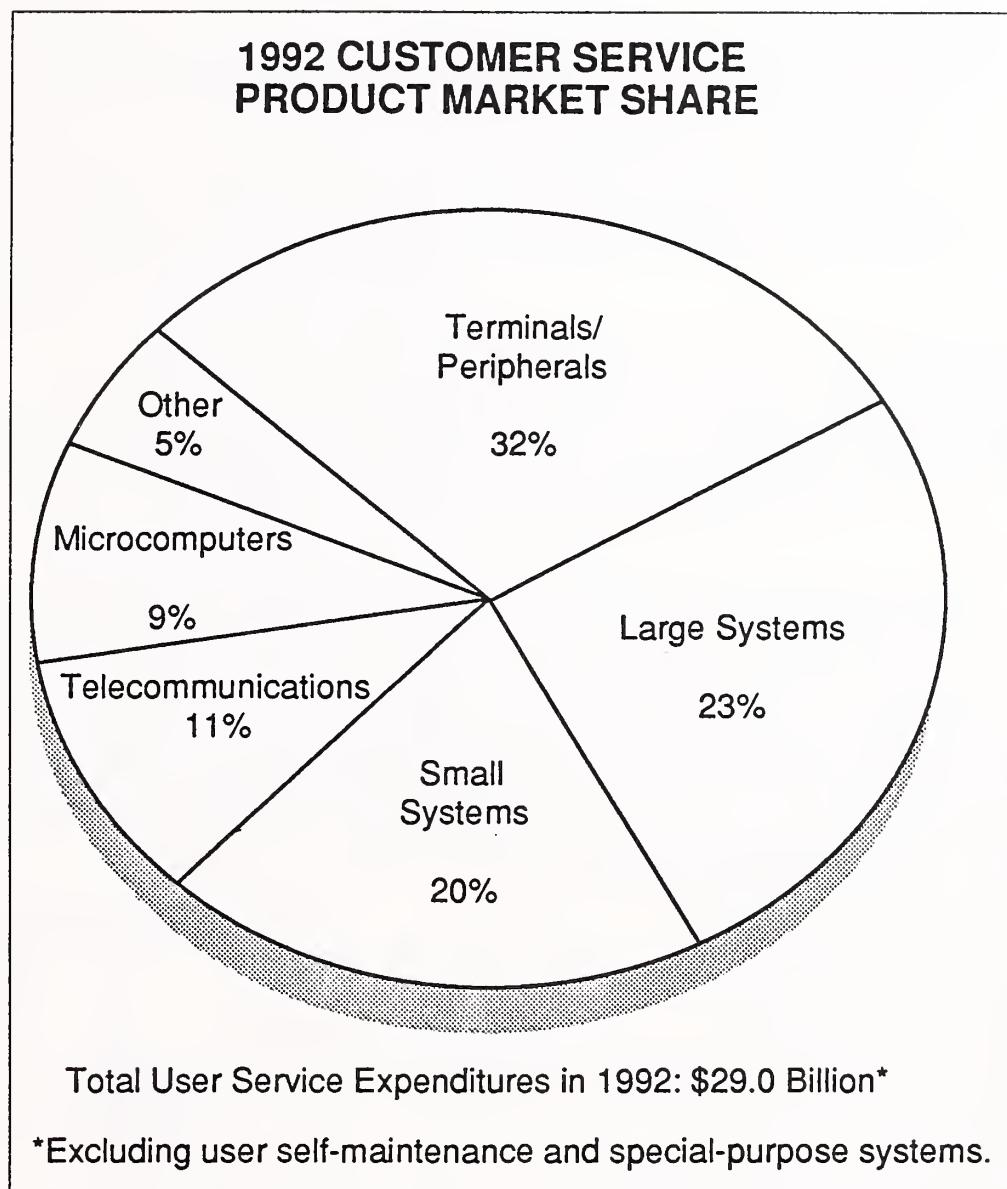
EXHIBIT III-2



2. Market Forecast

Although experiencing significant dollar growth in 1987, the small-systems service sector held steady with a 19% share, and large-systems took the hardest hit with market share reduced from 30% in 1986 to 27% in 1987. As shown in Exhibit III-3, this erosion from the large-systems share will continue, with the large-system support contribution falling to 23% by 1992.

EXHIBIT III-3



Following the decline of mainframe sales expected through 1992, this decrease in large-systems service share over the next five years will also be attributable to the increasing reliability and service delivery efficiencies in the mainframe arena. Able to further reduce their own costs of providing support, mainframe vendors will competitively benefit by passing these cost-of-ownership savings onto the customer in a marketplace under attack by small-systems and network solution vendors.

The increased competition between the sectors for users' systems dollars will also tend to contribute to the decline in large-systems revenues as discounting strategies enter into the competitive play (e.g., IBM's Customer Service Amendment). Although similar discounting schemes are also surfacing within the small-systems marketplace, higher expected

shipments within that marketplace will overshadow the bite these discounts will take from the overall small-systems growth rate.

The growth of the remaining market sectors (including small systems, telecommunications, and peripherals) will all be at the expense of the large-systems market with the rise of these peripheral and network-enhanced smaller systems. Although mainframe systems will always be a preferable alternative for certain high-volume and -criticality users, the needs of most users will be met by the increasing processing power and flexibility offered by network and small-systems vendors. Growth of these product bases will be followed by the need for small systems, telecomm, and peripherals support.

Having charged into the frontrunner position for the first time this year with 29% of the market (as was shown in Exhibit III-2), terminals/peripherals will continue to lead these growing market sectors within the support marketplace well into 1992. Growing to an \$9.4 billion industry by 1992 as shown in Exhibit III-4, the peripherals sector will remain the largest contributor to the total customer services market over the next five years, having gained a market share of 32% by 1992.

EXHIBIT III-4

**CUSTOMER SERVICE USER EXPENDITURES
1987-1992***
(\$ Billions)

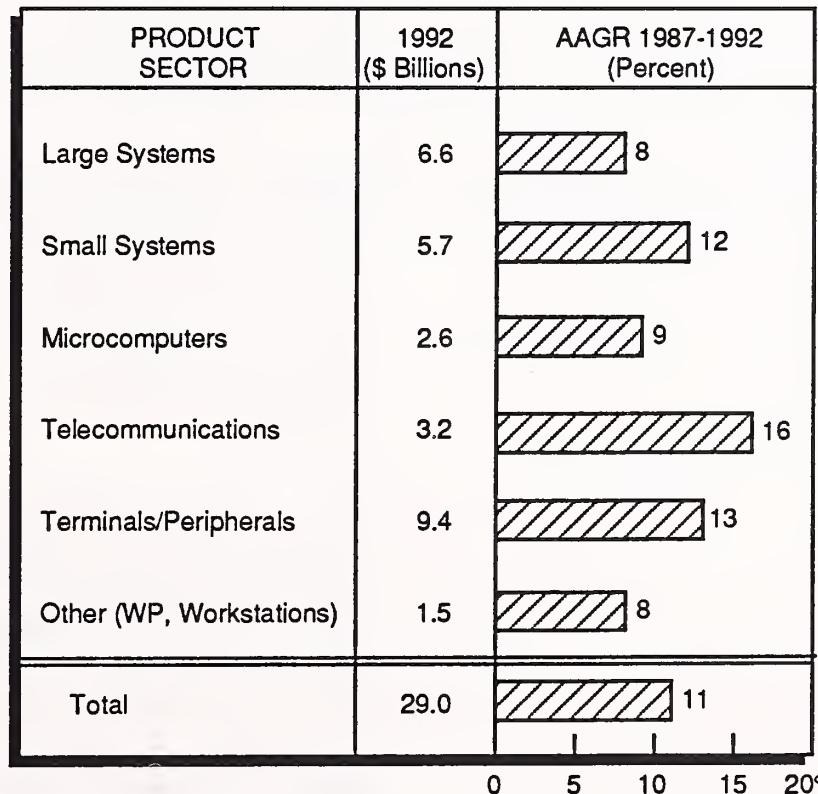
PRODUCT SECTOR	1987	1992
Large Systems	4.6	6.6
Small Systems	3.3	5.7
Microcomputers	1.7	2.6
Telecommunications	1.5	3.2
Terminals/Peripherals	5.1	9.4
Other (WP, Workstations)	1.0	1.5
Total	17.2	29.0

*Excluding user self-maintenance and special-purpose systems.

Exhibit III-4 presents a complete account of the expected dollar growth within each of these sectors, and illustrates the gain the small-systems market will make on large-systems service revenues well into 1992. Although the large-systems market will experience a slowdown in absolute growth over those 5 years, the impact of the high-ticket mainframe marketplace will still be considerable, contributing an expected \$6.6 billion to the 1992 total.

Taking the largest leap in service dollar marketshare will, again, be the terminals/peripherals sector, gaining a total of \$4.3 billion over the next five years. Although this market sector will continue to dominate the \$29 billion total marketplace, the telecommunications market will in fact show a higher average growth rate over that five-year period.

Edging out even the high-growth peripherals sector, the telecomm marketplace will grow to \$3.2 billion by 1992 thus exhibiting the highest aggregate annual growth rate of all component sectors – 16%, as shown in Exhibit III-5. Both the terminal/peripherals and small-systems sectors will also grow at a rate above the that of the entire marketplace, making these three markets by far the most attractive within the service arena.

EXHIBIT III-5
**CUSTOMER SERVICE USER EXPENDITURES GROWTH
1987-1992**


B**TPM Market Size and Forecast by Product Type****1. Current Market Size**

Embedded within these overall customer services revenue numbers is the third-party service contribution – one that is gaining greater importance each year. With TPM expenditures up 17% from 1986 figures, the third-party market sector is growing at an even faster rate than the overall service marketplace (which, in turn, is surpassing the growth of the information processing industry in general). As shown in Exhibit III-6, third-party market share totaled 11% in 1987, contributing \$1.825 billion in revenues to the overall customer services marketplace.

With TPM vendors having made their entry into the industry through doors left open by micro and peripherals manufacturers (and telecomm/modem vendors to a lesser extent), the TPM market still remains dominated by support dollars earned in these lower-end market sectors. The support of these small-ticket items was low priority for many manufacturer support organizations, leaving an open marketplace that growing third-party operations quickly filled.

Although the small-ticket nature of these products necessarily leaves less room for service profits, third-parties (and now many manufacturers under pressure to increase revenues) have managed to leverage low-end support contracts into higher margin business. Often an important step in securing account control, TPMs are becoming increasingly successful at using micro or peripheral support as a “foot in the door” of potential systems support customers.

TPMs have also been successful these sectors due to the higher price-sensitivity of many users in the low-end. Offering significant discounts from manufacturer-supplied support in the past, TPMs were an attractive alternative to users with predominant cost concerns. Although increasing contention for support dollars is introducing a new wave of price-based competition, third-parties still retain the greatest edge within these low-end market sectors.

Although still a relatively small force within the small-systems sector, this edge is quickly spreading into the minicomputer marketplace, where TPMs currently hold 8% of the support share. Cost-conscious systems users are now able to satisfy higher processing needs with a networked small-system solution and, TPM having gained legitimacy within the systems marketplace over the years, can look to third parties for competent service at a lower price. The small-systems support menus of many third-party vendors were enhanced in 1987, especially in the IBM System 3X and DEC VAX lines.

EXHIBIT III-6

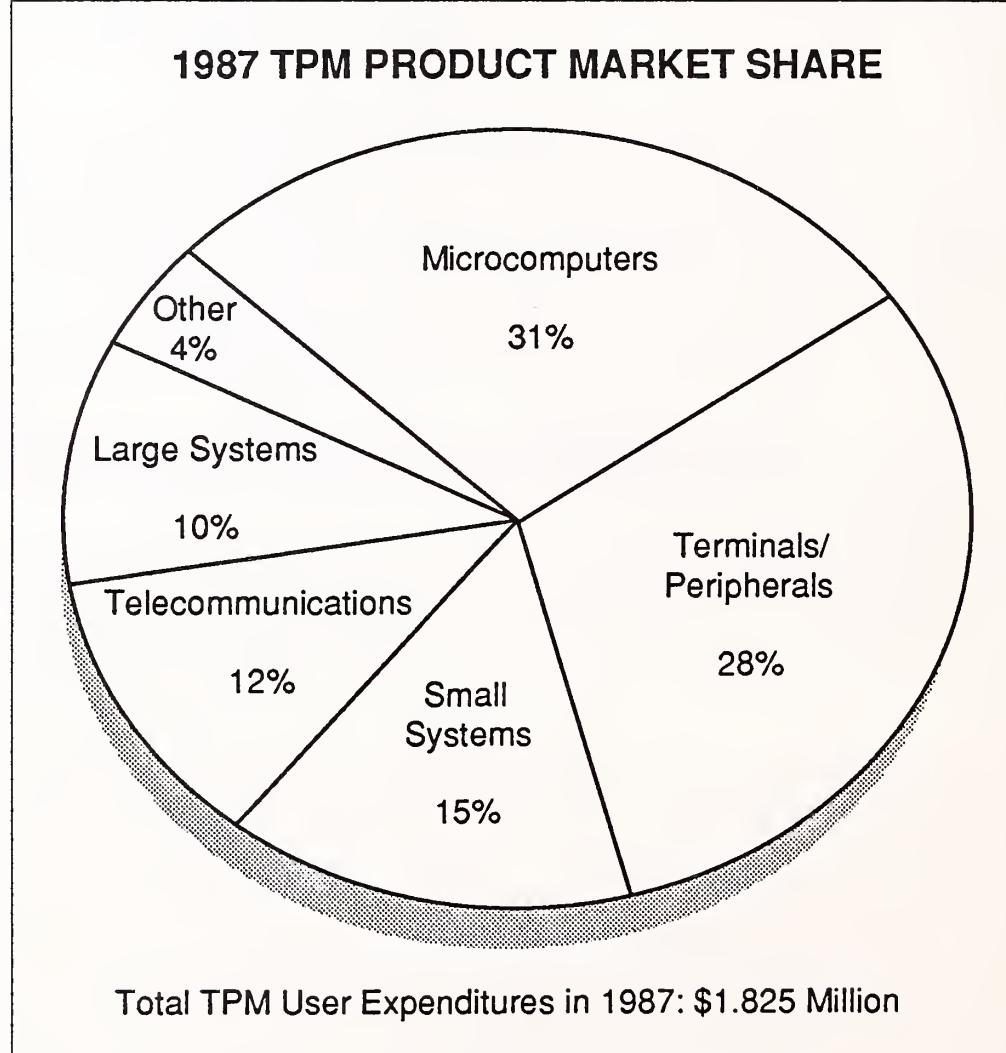
**TPM SHARE OF TOTAL
CUSTOMER SERVICE MARKET
1987**

PRODUCT SECTOR	TOTAL SERVICE EXPENDITURES (\$ Billions)	TOTAL TPM EXPENDITURES (\$ Millions)	THIRD-PARTY SHARE OF TOTAL PRODUCT SECTOR (Percent)
Large Systems	4.6	183	4
Small Systems	3.3	265	8
Microcomputers	1.7	568	33
Telecommunications	1.5	225	15
Terminals/ Peripherals	5.1	511	10
Other	1.0	73	7
Total Market	17.2	1,825	11

Large systems remains the weakest of the TPM market sectors, third-party securing only 4% of the mainframe service total in 1987. Large-systems users are less attracted to the price advantages offered by TPM, and as a result, the mainframe market is still dominated by manufacturer service organizations able to fulfill the tight requirements of these users. Although users' perceptions of the quality of third-party support at all levels has increased with the visibility of TPM in the marketplace, large-systems service remains primarily in the realm of the manufacturer.

As illustrated in Exhibit III-7, these market share proportions hold roughly true within the third-party market itself, with microcomputers and peripheral products making up the greatest share of TPM revenues, while large systems contribute the smallest proportion of total TPM expenditures. TPM is well established within the micro and peripherals marketplace, and the contribution of these two sectors accounts for better than half (59%) of the entire TPM revenue base.

EXHIBIT III-7



Although third-party maintenance maintains a relatively strong hold within the entire telecommunications service sector (securing 12% of market share), this expanding marketplace has been blocked by technological barriers in the past, and the majority of TPM activity was confined to simple modem service. Third-party growth in this area has been limited in the past (an industrywide shortage of skilled technicians being one of the most serious barriers), but the potential of the fast-growing networking marketplace will undoubtedly provide the impetus for service vendors to overcome these obstacles. Telecommunication is an area of support slated for expansionary efforts, especially among leading TPM vendors.

2. TPM Market Forecast

Exhibit III-8 provides a complete breakdown of the growth expected in each of these market segments over the next five years. More than doubling the 1986 TPM figure (just under \$1.6 billion), 1992's TPM expenditures are expected to reach a total of \$3.2 billion. Although this increase is a considerable one, a number of emerging market factors have caused a serious reconsideration of even-higher previous forecasts.

EXHIBIT III-8

TPM USER EXPENDITURES 1987-1992 (\$ Millions)

PRODUCT SECTOR	1987	1992
Large Systems	183	204
Small Systems	265	489
Microcomputers	568	974
Telecommunications	225	494
Terminals/Peripherals	511	920
Other (WP, Workstations)	73	140
Total TPM	1,825	3,221

Most notable is the re-emphasis manufacturers have placed on customer service revenues. With the slump in hardware revenues felt throughout the industry in recent years, users' maintenance dollars have a new found importance to manufacturers battling to stay afloat. With IBM leading the pack in 1987, equipment vendors have thrown a number of "monkey wrenches" into TPMs' competitive plans over the past year.

Lowering competitive service pricing while beefing-up discounting plans, manufacturers – especially within the midrange (high-end small systems to low-end mainframes) marketplace – are placing a whole new set of competitive demands on their third-party counterparts. Adding additional contract dollars to their own bottom line, while at the same time doing serious damage to many third-party competitors, equipment vendors' aggressive new stance in the support market is vastly altering the competitive climate in the support marketplace.

Exemplifying this newly tightened support strategy was the stream of service policy announcements made by IBM over the past year. Adding teeth to its original Corporate Service Amendment announcement (of October, 1986) in March of 1987, and a Midrange sister amendment in September, IBM spurred a wave of reaction from its third-party competitors striving to match or beat IBM's offering.

With technology in place to take full advantage of the "help desks" and user diagnostic feed-back, IBM's position provides much more room for profit from the discounting schemes than do the third-parties up against them. Many TPMs attempting to outdo Big Blue have introduced discounting plans that preclude any of the cost savings provided in IBM's original (user-involved) service agreements, and must bear the brunt of these discounted revenues in efforts to protect their IBM customer base. (See Chapter IV, section B, for a further discussion of the impact of the CSA.)

In addition to the CSA plan, IBM also hit the service industry with a number of maintenance price cuts made throughout 1987. Further tightening the grip on spares supplies to non-IBM service agents, a reduction in the number of "retail" parts outlets was also announced late in 1987, stirring considerable concern within both the TPM industry and the leasing/brokering marketplace. Also pressuring these sectors was the cutback on time and materials (T&M) resources by IBM, crippling the service brokering market and significantly wounding many smaller third-parties dependent on IBM T&M assistance as a backup to their own resources.

Considered even more significant by some in the marketplace was the establishment of a new "de-facto" industry standard by IBM with the announcement of universal 24-hour/7-day maintenance coverage. Especially within the majority IBM-service sector of the third-party market, TPMs will be forced to reckon with the new expectations this expanded service standard imposes on the user base. Effective in December of 1987, few competitors have had time to analyze the impact of this announcement or modify policy as this report goes to press, but the repercussions of this announcement will surely be a major factor affecting the health of the 1988 TPM marketplace.

In addition to the pressures these moves place on TPMs in direct competition for IBM equipment service, the new aggressiveness of IBM will likewise be felt by other manufacturers competing in the equipment marketplace. Price reductions, discounting offers, and the 24/7 coverage at 11/5 fees will all contribute significantly to a drop in the cost of owning an IBM machine. In efforts to counter IBM's moves with their own new strategies, other manufacturers will in turn worsen the competitive outlook for TPMs in their own product markets. In effect, the third-party market will be placed in a "double bind" by IBM's industry lead toward aggressive service business.

Other equipment vendors, even before IBM's lead, were tightening competition on the third-party marketplace with similar service pricing cuts, and by offering to market their own brand of "third-party support." DEC lead the major vendors in this strategy with its DECompatible plan, offering limited support of other vendors' equipment as attached to a DEC system under contract; even IBM now provides users with a limited offer of help with certain non-IBM equipment needs. Although few equipment vendors (without separate TPM businesses) provide a very extensive third-party menu, the move into multivendor service reduces the competitive advantage that TPMs previously enjoyed with this once-unique service offering.

All in all, the slump in hardware profitability has turned equipment vendors' eyes toward the protection of, if not increase of, customer service revenues. Competitive moves of the caliber of those made within the service industry over 1987 will certainly have repercussions still being felt in the 1992 support marketplace.

3. TPM Market Forecast by Product Sector

As seen in Exhibit III-8, microcomputer and terminal/peripheral maintenance, having been the starting blocks for the third-party industry, will remain the largest contributors to the TPM market through 1992. These two product sectors still expected to control over half the marketplace in 1992, terminals/peripherals will show a slight gain on micro support over the next five years, and small systems will take a similar share (15%) of the total pie in 1992. These projections are shown in Exhibit III- 9.

EXHIBIT III-8

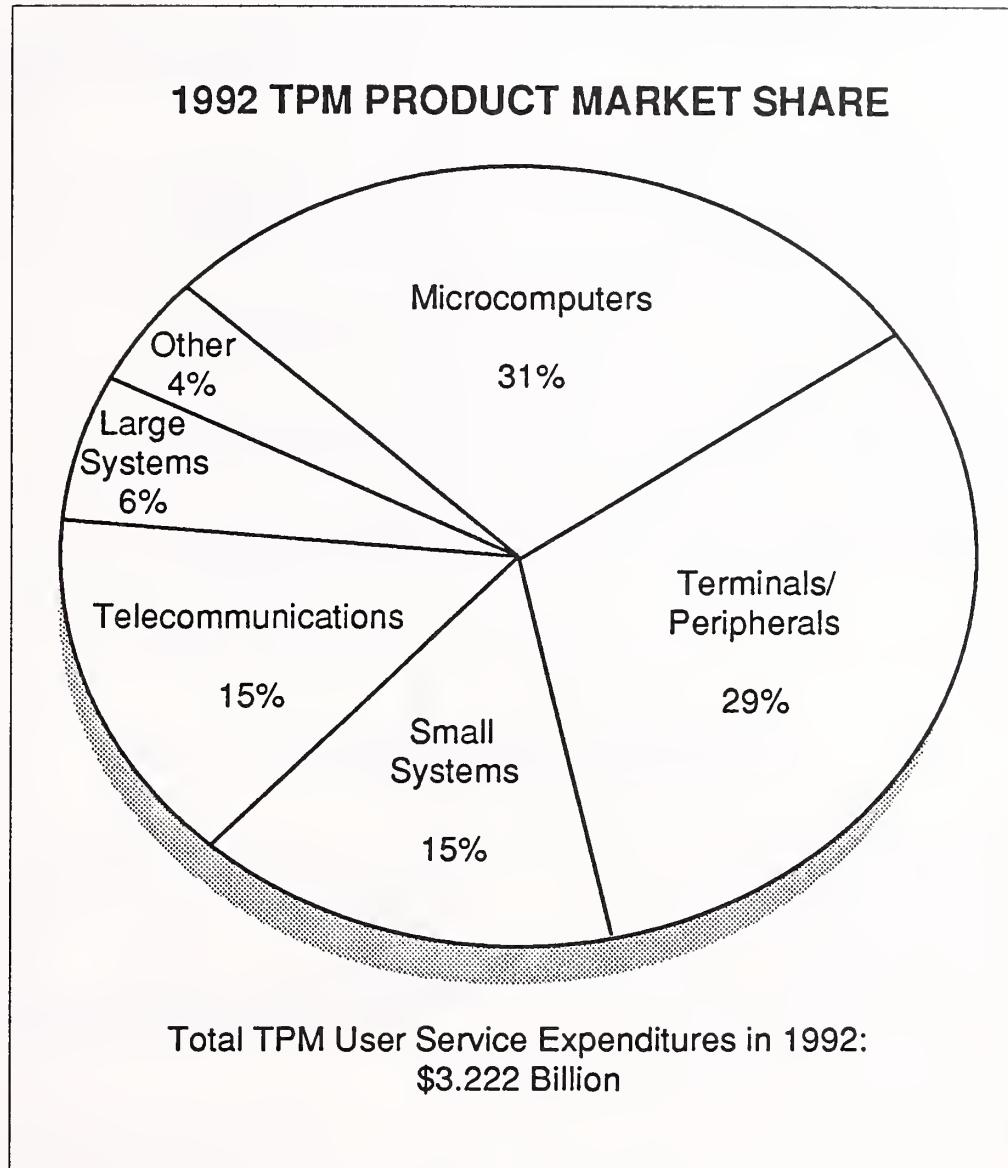
TPM USER EXPENDITURES

1987-1992

(\$ Millions)

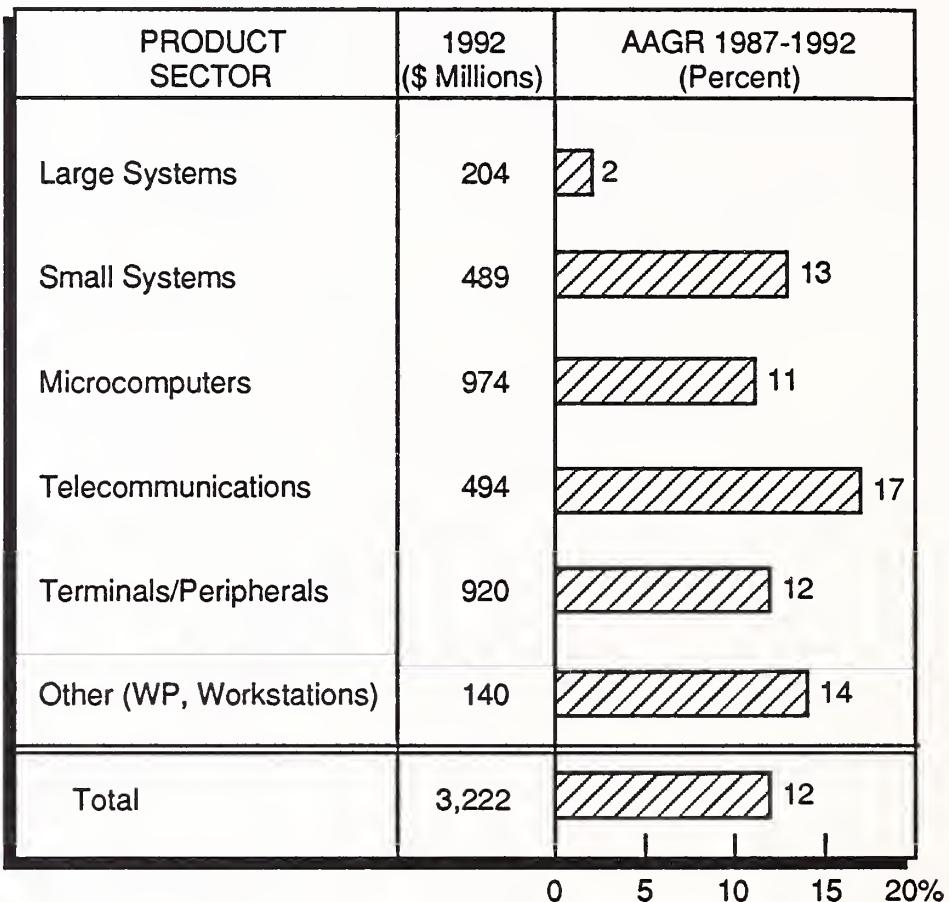
PRODUCT SECTOR	1987	1992
Large Systems	183	204
Small Systems	265	489
Microcomputers	568	974
Telecommunications	225	494
Terminals/Peripherals	511	920
Other (WP, Workstations)	73	140
Total TPM	1,825	3,221

EXHIBIT III-9



The most significant change to the composition of the TPM marketplace over the next five years will be the further drop in large-systems presence (from 10% in 1987 to only 6% by 1992), and the coincidental growth of third-party telecommunications service. By 1992, the telecommunications sector will be taking up the slack left by the disappearance of large-systems support; telecommunications service is expected to show the highest overall growth rate over the forecast period of all major TPM market sectors. As shown in Exhibit III-10, telecomm is expected to make a 17% jump over the next five years, an increase that will match the significance of the telecommunications market with that of the small-systems sector (both making up 15% of the market by 1992 as shown in Exhibit III-9).

EXHIBIT III-10

TPM USER EXPENDITURES GROWTH
1987-1992

Since the two marketplaces are inextricably tied as the networking environment comes to prominence, third-party vendors now heavily involved in the support of small systems will lead the industry in the attempt to fill the "knowledge gap" now plaguing the telecommunications support sector. It can be expected that a number of new third-party players will emerge from the telecommunication equipment industry, and will leverage their staffs' experience in a marketplace hungry for qualified technicians.

The trend toward networked small systems will spur growth in the TPM minicomputer marketplace through 1992, as small-systems service grows at an average annual rate (13%) exceeding that of micro and peripheral support (Exhibit III-10). Third parties will hold 9% of the small systems market in 1992, as shown in Exhibit III-11. As TPMs continue to increase their profile within the small-systems marketplace, the acceptance

of third-party vendors as a reliable source of service in this price-sensitive product sector will increase.

While penetration in the minicomputer sector increases, however, third-party growth in large systems support will further slow through 1992. Third-party mainframe support will not only shrink in terms of growth over that period, but will also lose ground in terms of share of the total support market into 1992. As high-powered small-systems networks continue to replace mainframe installations at the lower-end of the large systems marketplace, the remaining mainframe user base will, in effect, have the highest of requirements for service of their critical systems. As holds true with the mainframe marketplace today, users with highly critical needs prefer the (perceived) security of manufacturer-supplied support, and this trend is expected to continue as large systems requirements are forced upward.

EXHIBIT III-11

**TPM SHARE OF TOTAL
CUSTOMER SERVICE MARKET
1992**

PRODUCT SECTOR	TOTAL SERVICE EXPENDITURES (\$ Billions)	TOTAL TPM EXPENDITURES (\$ Millions)	THIRD-PARTY SHARE OF TOTAL PRODUCT SECTOR (Percent)
Large Systems	6.6	204	3
Small Systems	5.7	489	9
Microcomputers	2.6	974	38
Telecommunications	3.2	494	15
Terminals/Peripherals	9.4	920	10
Other	1.5	140	9
Total Market	29.0	3,221	11

4. "Hard" and "Soft" TPM Service Market Forecast

From its simple beginnings as an alternative to manufacturer-supplied hardware maintenance, TPM has come to encompass an expanding list of services well beyond simple repair support. As most third-party vendors now offer user support services ranging from system and component refurbishment and remanufacturing to software support and consulting services, the term "TPM" has come to mean much more than its traditional "maintenance" definition implies.

Exhibits III-12 and III-13 provide an expanded look at the future third-party marketplace, in terms of "hard services," including the traditional hardware maintenance aspects of TPM, and "soft services," such as software support, education, and consulting services. As the competition over maintenance support revenues heats up between manufacturers and third parties, profitability in these operations is squeezed, and increasing numbers of TPMs are expanding their service menus in other areas to help offset that shrinking margin.

Most major third-party players have been involved in certain "soft" services for some time now, including professional consulting and planning support, user education, and installation/deinstallation services. These more traditional areas of third-party intervention will continue to offer potential over the forecast period, with average annual growth rates from 18 to 21 percent. Generally less capital-intensive than hardware support activities, these types of "extra" services are attractive additions to TPMs' core maintenance activities and also enhance a vendor's "full-service" image.

Of even higher potential are software support services, an area where manufacturers are traditionally lacking yet user requirements remain high. A number of third-party leaders have accelerated their movement into software support over the past couple years, and, having general success and acceptance within the marketplace themselves, will undoubtedly prompt other TPMs to follow into the software arena.

Users are reporting extremely low satisfaction with the software support being provided by their systems vendors, leaving the marketplace ripe for third-party intervention. As shown in Exhibit III-12, third-party software support growth is expected to skyrocket to \$293 million by 1992, surpassing all presently established soft-services sectors with an average growth rate of 52% annually, contributing heavily to the overall 19% expected annual growth for the soft-services overall market over the forecast period.

EXHIBIT III-12

TPM "SOFT" SERVICES, 1987-1992

"SOFT" SERVICE	\$ MILLIONS		AAGR (Percent)
	1987	1992	
Leasing	440	809	13
Software Support	36	293	52
Professional	28	73	21
Education	31	81	21
De/Installs	30	69	18
Total	565	1,325	19

TPMs do not necessarily need to provide error fixes or other code work to become successful in the area of software support. Instead, TPMs can make a measured entrance into software support by offering high-visibility, (relatively) low-cost services such as telephone (hotline) consulting, problems data bases, and documentation support.

Exhibit III-13 compares this total AAGR to that of the hard-services marketplace and examines the hardware maintenance sector of that market in particular; clearly the mix of third-party service revenues will be undergoing significant change over the next five years. In the face of increased aggressiveness of manufacturers and leading third-party players alike, the TPM market will be forced to look beyond this maintenance provision to shore up hardware service revenues. Falling prices and rising user expectations are very simply squeezing nondiversified TPMs out of the marketplace.

EXHIBIT III-13

TPM "HARD" SERVICES, 1987-1992

"HARD" SERVICE	\$ MILLIONS		AAGR (Percent)
	1987	1992	
Maintenance	1,825	3,222	12
Refurbishment	35	81	18
"Fourth-Party"	110	338	25
Total	1,970	3,641	13

C

The "Fourth-Party"
Maintenance Market

As illustrated in Exhibit III-13, a major part of the growth within the hard-services sector will be in the so-called "fourth-party" market, a classification that covers those in the service market who provide component and board-level repair requiring highly specialized equipment and facilities. Fourth-party repairs are provided primarily to other service organizations, rather than to users (hence the term "fourth-party"). Although the fourth-party marketplace emerged very basically as a support industry to TPMs and VARs and provided an economical alternative to investing in the facilities needed to perform such specialized work, growing numbers of large third-party maintainers are adding "FPM" to their menus of service offerings.

Major players who can access the kind of capital necessary to establish fourth-party operations can, in the long run, save money by bringing the remanufacturing costs in-house, as well as enjoy a healthy profit by providing the service to other vendors. Revenues generated from fourth-party activities are expected to rise by a healthy 25% annually over the next five years, and will be contributing a total of \$338 million to the service economy by 1992.

"Fourth-party" maintenance offers benefits to both manufacturers and other service organizations. Sending a product or part back through the manufacturer's facilities takes time and interrupts the normal manufacturing cycle; a manufacturer's priority is the manufacture and assembly of

new products. TPMs and other service organizations usually do not have the facilities (e.g., clean rooms) for fourth-party maintenance. In addition, FPMs supplement service organizations' spare parts supplies.

A further breakout of the developing fourth-party market is presented in Exhibit III-14. Dominated by the peripherals product sector because of the nature of the business, the FPM marketplace is expected to more than triple in size over the forecast period, with significant growth occurring in these peripherals support revenues. As well as making the greatest contribution to total FPM revenues for the next five years, the peripherals sector will show a considerable growth rate through 1992 at 29% annually, beat only by the large-systems product group (which, due to the low penetration FPMs have made into the mainframe market by 1987, will still amount only to a small fraction of the total market size).

EXHIBIT III-14

**"FOURTH-PARTY" MAINTENANCE MARKETS
1987-1992**

MARKET	\$ MILLIONS		1987-1992 AAGR (Percent)
	1987	1992	
Large Systems	1	11	58
Small Systems	17	53	25
Peripherals	33	120	29
Microcomputers	30	66	18
Telecommunications	19	58	25
Other	10	30	25
Total	110	338	25

Both the small systems and telecommunications marketplaces will offer significant potential to FPM vendors well into 1992, as each of these equipment marketplaces flourishes and invites the support of third- and fourth-party businesses. Micro FPM will remain a significant part of the fourth-party market, although showing a slowing growth rate over the forecast period. Through 1992, support of micro systems will remain the second largest contributor to total fourth-party market size.

Once mainly an industry of small, local operations, FPM is now a fast-growing part of the service market and, as the marketplace matures, a number of market leaders are pulling away from the pack. Growing firms like Dynservice Network and CPX, plus the developing depot/fourth-party operations of TRW, TSSI, and Pritronix/Carterfone are greatly increasing the visibility of the fourth-party industry. Further consolidation and growth by these and other leading fourth-party players will help to legitimize traditional fourth-party business, as well as invite the expansion of FPM into new service areas. Other services that will relieve the overhead burden for smaller service vendors (parts handling, logistics networks, etc.) will follow naturally from the supportive role FPMs now play in the service industry.

D

The Top 20 Players in the Third-Party Marketplace

Throughout 1987, clear market leaders continued to develop within the third-party marketplace. A number of significant mergers and acquisitions brought smaller names into the ranking top twenty, including the Pritronix/Carterfone buyout and the purchase of Zentel's service operations by Dow Jones. Despite a difficult year in the service industry (and information processing industry as a whole), the leading players managed to expand their collective hold on the market, increasing total market share controlled by the "top twenty" to 90.3% from a total of 86.9% in 1986. Details are in Exhibit III-15.

Remaining neck and neck for the number-one position are TRW and Sorbus, these two giants holding a combined 30-plus percent of the entire TPM marketplace in 1986. Although TRW has securely held its top position for a number of years, Sorbus' acquisition by Bell Atlantic served to reinforce its investing power, and the numerous mergers and buyouts that have been financed by its parent company since the adoption continues to bring Sorbus closer to TRW's stature.

The move that brought the RCA Services Company into the GE fold greatly augmented the competitive advantage of the GE Computer Services division. Even after the post-merger trim-down of the combined operations, GE has risen to the number-three position in 1987. And, despite poor years financially for both Intelogic Trace and CDC Technical Services, these two contenders have continued to garner enough new service business to remain close behind number three. These top five third-party vendors control an impressive 60% of the total TPM marketplace.

EXHIBIT III-15

TPM MARKET LEADERS

RANK	VENDOR	1986 TPM REVENUES (\$ Millions)	OVERALL MARKET SHARE (Percent)
1	TRW	250	16.0
2	SORBUS	240	15.4
3	General Electric	180	11.5
4	Intelogic Trace	156	10.0
5	Control Data Corporation	110	7.1
6	Servcom	72	4.6
7	Momentum	70	4.5
8	Unisys	42	2.7
9	Pritronix	40	2.6
10	Dataserv	37	2.4
11	Grumman	36	2.3
12	Western Union	25	1.6
13	Xerox	24	1.5
14	McDonnell Douglas	23	1.5
15	First Data Resources	22	1.4
15	Total Technical Services	22	1.4
17	NCR	17	1.1
18	Decision Data	15	1.0
19	Dow Jones	14	0.9
19	TSSI	14	0.9
	Total	1,409	90.3

Although varying in their approach to the market, these five market leaders share one common characteristic: All have exercised an active and ongoing acquisition strategy, backed by the security of a larger parent corporation. Sorbus was most active during 1987, consummating the purchase of four service firms with the help of its parent, Bell Atlantic. Although Sorbus has had a history of aggressive acquisition in TPM, its purchase by Bell Atlantic has noticeably strengthened its purchasing power, and the strategy in turn has strengthened its market position.

TRW Customer Service Division, as the long-standing giant in the third-party industry, has also been known for its interest in acquisition, and gained much of its current stature through an acquisition strategy deployed early in the market's development. An operation grown out of the service arm of Singer (an acquisition by the TRW parent corporation), TRW CSD's growth has followed a calculated and steady path since it entered TPM, and although seemingly preoccupied with top management changes in 1987, will undoubtedly continue to expand operations through acquisition.

General Electric, after combining forces with the RCA Services operation, has made one of the most dramatic climbs up the top twenty ladder as one part of a strategic move made by its parent corporation. Wedding the fourth- and fifth-largest TPMs (at the time of the merger), GE will continue to be a major force in the TPM market as the combined operations build greater synergy as reorganization efforts fall into place.

Fifth-ranked CDC has also been distracted over the past year by reorganizational efforts, which transformed CDC Engineering Services Division into CDC Technical Services in 1987. Having had steady backing from its parent manufacturer in acquisition dealings earlier in its development, 1987 stands out as a quiet year for CDC because it is faced with falling corporate revenues that prompted the corporatewide reorganization. As CDC's trimmed operation reaches full speed in 1988, the market can expect a continuing fight from the number five position.

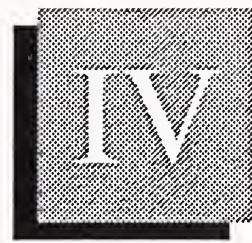
Lead by the aggressive Asher Adelman, Intelogic Trace has had a consistent history of merger involvement, and although bids for such potential candidates as Momentum's service operations, and Telex Corporation have thus far been unsuccessful, IT has continued to pick up smaller TPM players along the line to augment its third-party business.

Although still dependent on business from previous manufacturer parent Datapoint, IT hopes to loosen these ties, and pursue a more independent

TPM stance. Having acquired two independent service business bases within its home state of Texas in 1987 despite falling revenues, IT and Chairman Adelman are indicating serious intent to continue this growth through an acquisition strategy.

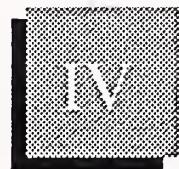
These market leaders were not the only forces gaining power in 1987 through mergers. Glancing down the top-twenty listing, a number of additional significant acquisitions come to mind from these smaller players. Most notable is the rise of the Pritronix operation, making its first appearance in the top rankings at number nine. Taking the industry by surprise, the aggressive company took over the service operations of Carterfone Corporation, a larger company also growing within the third-party marketplace. Other smaller firms, such as DynService Network have continued to successfully follow these market leaders in an aggressive acquisition strategy, and are making a substantial impact in the customer service marketplace.

Obviously, the impact of this market consolidation on TPM (and FPM) revenue share has been significant over 1987. As the marketplace continues to mature, increasing competition is forcing the weaker players into the folds of the financially sound, and the market continues to be ruled by fewer and fewer service giants. The increased threat these TPM giants are posing to manufacturers has undoubtedly contributed to the increased aggression equipment vendors are showing in terms of support. Although once a largely ignored and underestimated sector of the service market, third-party maintenance has grown into a prominent force to be reckoned with.



The Third-Party Maintenance Industry

—



The Third-Party Maintenance Industry

A number of issues had fundamental effects on the evolution of the third-party market over the past year. In other words, 1987 was a year of increasing aggressiveness within the service industry, and the battle between manufacturer and TPM organizations escalated. In the face of an increasingly powerful third-party force being lead by a handful of large (and growing) TPM firms, manufacturers are recognizing the very real threat of third-party maintenance to their continued financial health, especially after the hard fiscal year most in the hardware industry experienced. Support revenues are quickly gaining importance not only for those based in the support industry, but for all involved in the information processing industry today.

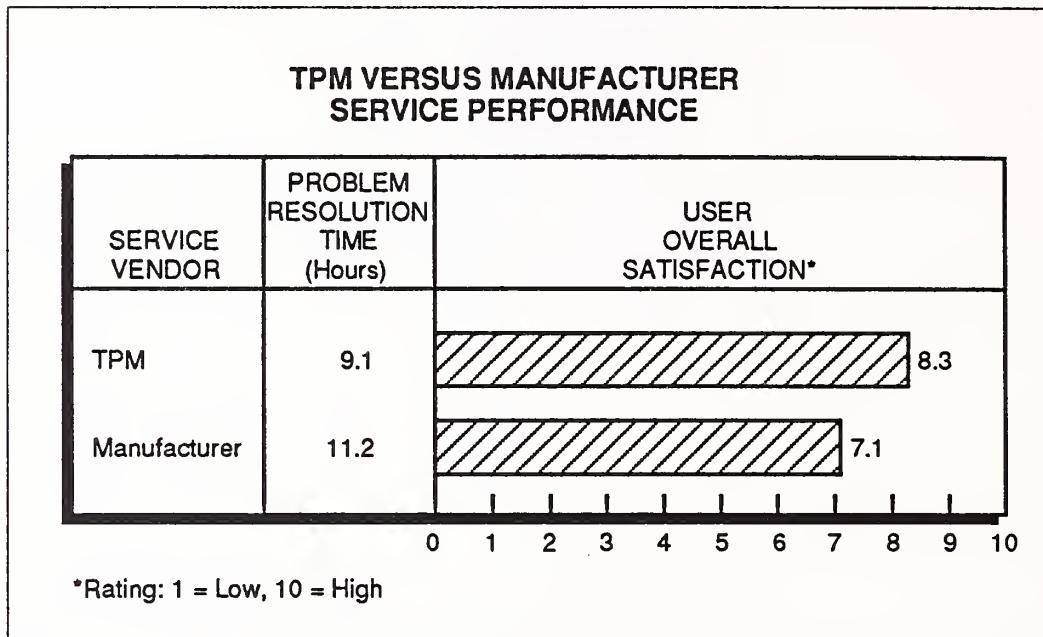
A

TPM versus Manufacturer Maintenance Performance

As illustrated in Exhibit IV-1, third-party maintenance sources are easily out-performing the manufacturer competition in terms of problem resolution times and user ratings of overall satisfaction with support. On average, users of third-party maintenance reported problem resolution times beating manufacturer responses by 2 hours.

As competition has increased within the third-party marketplace, TPMs serious about survival have managed to trim their response times to meet the rising user requirements. Spurred by the "buyers' market" conditions induced by a highly competitive industry, users are expecting higher levels of performance at lower prices. And, as the competitive battles ensue, users are receiving more. Users of third-party support remain better satisfied with their TPM alternative than with the support received from the equipment manufacturer organization; satisfaction with TPMs is now rated at a high 8.3.

EXHIBIT IV-1



Manufacturers now showing renewed concern over the third-party erosion of service revenues are faced with the task of increasing their service performance, while at the same time providing more competitive service plans. Lead by IBM in a widely proclaimed "year of the customer" strategy, manufacturers are joining the ranks of the third-party competition with promises of more responsive service delivery, and maintenance provided at discounted rates.

B
The Impact of IBM's Corporate Service Amendment

As an early kick-off to its "year of the customer" theme, IBM had announced the Corporate Service Amendment (CSA) late in 1986, providing its users with the chance to receive IBM support at significantly reduced prices. In unprecedeted move by IBM's service group, the CSA introduced a standard maintenance discount available for genuine IBM support, a discount previously upheld by IBM as a premium worth the associated premium price. The new agreement caused considerable stir among market players, and was met with even greater concern when March (1987) revisions and a (September) Mid-Range sister announcement gave the discounting scheme even more competitive clout.

The impact of such a drastic move by industry giant IBM is obvious. IBM stands as the leading competitor within the systems marketplace, as well as the basis for an overwhelming portion of the third-party maintenance industry, and the significant change in strategy sent the marketplace reeling. New terms and conditions set by the amendment became sudden "de-facto" standards set by the industry leader, which rapidly sprung from its position as the "sleeping giant" of the support industry to a lean competitor running at full bore.

Exhibit IV-2 reviews the major effects the CSA (and MRSA) will have on the competitive environment. Introducing standard discounting to IBM's service pricing structure, the CSA will reduce the traditional third-party price advantage. The CSA agreements offer price cuts of up to 45%, well exceeding the average TPM discount level, further increasing users' price sensitivity to support costs. Unlike manufacturer organizations who have other major sources of income with which to offset losses on maintenance operations, TPMs will be hit hardest by the increased price sensitivity the plan has introduced.

EXHIBIT IV-2

IMPACT OF IBM'S CORPORATE SERVICE AMENDMENT

CSA TERM	EFFECT ON USER	COMPETITIVE EFFECT
<ul style="list-style-type: none"> • Standard Maintenance Discounting Introduced 	<ul style="list-style-type: none"> • User Price Sensitivity Increased 	<ul style="list-style-type: none"> • Ability to Compete on Basis of Price Reduced
<ul style="list-style-type: none"> • User Involvement in System Support Process Required 	<ul style="list-style-type: none"> • User Absorbs Some Costs of Service Delivery 	<ul style="list-style-type: none"> • Vendor Has Less Control Over Service Quality
<ul style="list-style-type: none"> • Contract Term Ranges from 1 to 5 Years 	<ul style="list-style-type: none"> • Maintenance Becomes a Long-Term Budget Item 	<ul style="list-style-type: none"> • Account Control Increased

Further complicating matters are the two basic conditions of the plan, the requirement of user involvement in the support process and the extended term of the agreement. While both terms in effect allow IBM to regain some margin lost to lower pricing, competitors have all but dropped the cost-saving user involvement from their own CSA responses in an effort to outdo IBM. Combined with the increased account control IBM enjoys once a user installation is under such a long-term contract, the CSA, whether or not intended by IBM, will serve to effectively tighten third-party service competition.

Other 1987 policy changes following the CSA announcement also proved to further squeeze the TPM marketplace, including the new 24-hour/7-day service standard initially introduced as part of the CSA. Along with cutbacks on time and materials resource availability and the planned shutdown of a number of spare parts distribution centers, IBM's "year of the customer" seemed to carry just the opposite theme for the third-party marketplace.

C

Spare Parts Issues in the TPM Industry

The issue of spare parts has always been a troublesome one for the third-party market, and as hostility between manufacturers and TPMs over service revenues heightens, parts problems continue to mount. Although a number of suits have been brought to court over the the contention between the equipment vendors and TPMs over the problem, none have yet provided any clear legal direction for the industry. Manufacturers continue to cite cooperative written parts distribution policies, while third- parties continue to claim that unfair practices are the unwritten, real policy. And all the while TPM users' anxiety over parts availability rises.

Surfacing as a problem even for manufacturer-support vendors, user satisfaction with the parts availability performance in all service market factions is lagging well behind increasing customer requirements. The problem of rising per-unit costs for system spares is a blight to all support vendors, as a balance between investment in parts inventories and parts availability is attempted. With increasing internal pressures to decrease costs and increase service margins, the balance often tips away from immediate parts accessibility. Exhibit IV-3 illustrates spare parts pressures.

EXHIBIT IV-3

SPARE PARTS PRESSURES INTENSIFY

- Per-Unit Parts Costs Increasing
- Growing Resistance from Equipment Manufacturers
- User Requirements for Spares Availability High
- Internal Pressure to Increase Service Margins

Recommendation: Increased use of fourth-party parts sources.

Users are beginning to perceive this neglect on the part of support vendors, as spare parts availability became the number one user concern in 1987. Among all components of support delivery, parts availability was rated of highest priority for all users, and the issue showed the greatest

correlation with overall satisfaction with maintenance performance. For third-party vendors to remain competitive in the "buyers' marketplace," more emphasis will have to be placed on innovative parts distribution and sourcing, including the use of fourth-party sources. It has become obvious that user demands for secure parts backup are not going to disappear, and TPMs must satisfy user anxieties long before any definitive legal guidelines are established that might help alleviate parts procurement problems.

D

Extended Warranties and Their Effect on the Market

Further infringing on third-party competition were moves made by both IBM and DEC in 1986 and 1987 that effectively imposed a new set of warranty standards for the industry. These changes are shown in Exhibit IV-4. DEC leading the trend with its upgraded warranty for newly introduced VAX 8XXX machines (early '86), soon followed in 1987 with the extension of that offering for the entire IBM line of systems, including systems options and peripheral products.

EXHIBIT IV-4

1987 WARRANTY TERM CHANGES

VENDOR	PRODUCT LINE	PREVIOUS WARRANTY*	NEWLY INTRODUCED TERM
DEC	VAX 8000 Systems	90 Day	1 Year
DEC	All Systems, Options, and Peripherals	30 Day - 90 Day	1 Year
IBM	9370 Systems	90 Day	1 Year
IBM	3191 Terminals	90 Day	3 Years

*Or equivalent product.

Extending some warranties for lower-end products from 30 days to the full-year coverage, DEC's new warranty policy effectively stymied a fast-growing third-party market sector concentrating on expansion in the DEC marketplace. Although not wholly discouraging TPMs from attempts to win over business from DEC's user base, the new warranty provision effectively holds off TPM penetration to a great degree during that added 9 to 11-month warranty period.

In the same time frame came warranty extension announcements by IBM ranging from one year on 9370 midrange systems up to three full years on the 3191 terminal line. Although these additions did not equal the universal one-year introduction made by DEC in '87, the IBM move indicated to many the beginning of a trend that would have an even greater effect on the third-party marketplace.

Especially detrimental to the TPM market was the three-year introduction on the popular 3191 line, which effectively provided users with free servicing of the product for most of its useful lifetime. The new warranty policy successfully puts the new line of terminals out of reach of TPM, and many third parties fear that IBM will follow suit in other lines heavily penetrated by TPM.

Some third parties point out that TPMs have always had a number of factors working against their success in capturing the business of products in their early years. Limited availability of spares, documentation, and experience with the product have traditionally been stumbling blocks for TPM vying for contracts on young products, regardless of warranty length.

But despite these factors, the fact remains that TPMs will encounter increasing obstructions to market entry as the trend toward extended warranties spreads, and additional vendors' products are affected. The low (or nonexistent) profitability of "authorized warranty" work precludes even the chance for TPMs to recoup a portion of the losses they will experience during these warranty periods. Even if penetration later in the product's lifetime is possible, those months (or years, in some cases) of lost revenue potential will have a definite impact on the health of the third-party marketplace.

The escalation of third-party competition – in terms of warranty terms, service discounting trends, and spare parts contention – has taken the greatest toll on smaller third-party operations. With limited operations and capital, most local TPM organizations have much less of a chance to quickly respond to changing market factors, and thus are among the first casualties in an increasingly competitive market. This factor has contributed to the ongoing consolidation within the third-party marketplace, as stronger TPMs continue to add to their operations through acquisition of these weakened firms.

E**Third-Party Mergers and Acquisitions in 1987**

As the TPM market has matured, consolidation has occurred as a natural part of market evolution. As the market came to prominence and competition increased, only the strongest survived. And, as these market leaders gained momentum, acquisition of smaller contenders became a source of further growth, both in terms of operational resources and new business bases.

Acquisition continues to decrease the ranks of the "local" TPM organization. As can be seen in Exhibit IV-5, many top-twenty TPM leaders continued to exercise their takeover strategies in 1987, despite the effects of a harshly competitive year financially.

Consolidation in the TPM market is now moving to an even higher level, as the industry recognizes the full potential of the TPM business. Large holding companies are now entering the TPM picture and, in turn, swallowing up these large third-party players to add to their own holdings. 1987 saw a number of such acquisitions, and this new breed of third-party players is adding yet another dimension to TPM competition.

Holding companies such as Bell Atlantic, Bell South, Alcatel NV, and Onset Corporation were active at the highest dollar level of acquisitions in 1987, bringing major TPMs like Servcom, Dataserv, and Decision Industries into the corporate fold. Bell Atlantic, one of the first to enter this new level of competition, continues to lead the industry in TPM merger moves through its initial strategic purchase of third-party leader Sorbus in 1986.

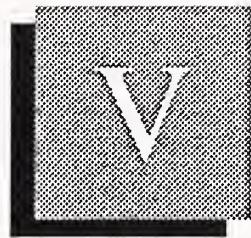
As these holding companies acquire TPMs, their purpose is obvious – to build the profitability of the business and increase its contribution to the parent's holdings. Backed by these financially powerful firms, the acquired TPMs enjoy an availability of "liquid" capital that many independent third parties are denied as costs and competition increase. The holding companies, with resources typically spread across a number of businesses and industry interests, are equipped to feed these third-party interests even in times of poor cash flow for the TPM operation.

The effect this new form of competitive advantage will have on the TPM market is tremendous. Previously third-party operations who were grown from a successful manufacturing parent (i.e., TRW, Unisys, CDC) once held exclusive rights to this financial advantage, but now TPMs from the lower ranks of the top twenty are being provided with equal purchasing power. These new forces in the market will hasten the consolidation now transforming the third-party industry, and bring with them the rise of a new breed of third-party "superpowers."

EXHIBIT IV-5

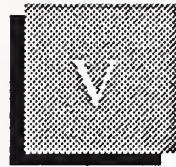
1987 TPM ACQUISITIONS

ACQUIROR	ACQUIRED COMPANY	SERVICE REVENUE BASE (\$ Millions)	PRINCIPAL MARKET SERVICED
Alcatel NV	Servcom	72	IBM, Network
Bell South	Dataserv	37	IBM
Bell Atlantic	ESS, Ltd.	18	DEC
Onset Corp.	Decision Industries	15	IBM
Sorbus	Jolynne Service	6	Federal
DPCE	Systec	5	Amdahl, IBM
Dow Jones	Zentel	5	Zentel, Lear
Sorbus	Pacific Computer Corporation	4	Amdahl
Sorbus	Maintenance Innovators, Inc.	2	IBM
Bell Atlantic	Greyhound Capital Corp.	N/A	IBM, DEC
Decision Industries	John Iverson Co.	N/A	DEC
Intelogic Trace	Texas Troubleshooters	N/A	IBM
Servcom	ECMI	N/A	IBM
TRW	United Equipment	N/A	Medical



Recommendations and Conclusions

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Recommendations and Conclusions

The third-party maintenance market is currently in a maturation phase, reflected by slowing revenue growth and larger acquisition and merger activities as the major players attempt to gain access into new markets. Smaller TPMs have already fallen out of the market, through normal attrition or acquisition by larger service organizations. As a result, competition for new service business has tightened between the larger TPM players and the manufacturers, who have redoubled the efforts to win back lost service business.

Most visible in its efforts to regain lost service business was industry giant IBM, with its announcements of service discount plans (CSA and MRSA), as well as other service policy announcements that showed a determination to compete on a price basis.

The key aspect of IBM's new service directive is account control, since IBM has always recognized the contribution that service and support offerings had on continuing product sales. IBM dubbed 1987 as "the Year of the Customer," and made a number service moves to slow and even reverse the migration of present and future IBM customers to other suppliers.

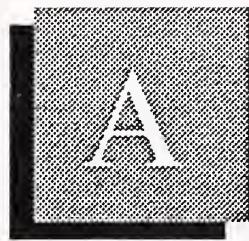
TPMs had to respond to IBM's moves with similar policy and pricing changes, and in the case of the CSA, even to exceed IBM with regard to requirements placed upon the customer. While matching and even "raising" IBM was viewed as necessary by some, TPMs may have placed themselves in a precarious situation, particularly with regard to the discounts needed to match IBM's CSA.

Specifically, TPMs may be pricing themselves into a corner by offering CSA-like discounts without attaching user-involvement requirements to

help cover the costs (in lost revenues). Only CDC, with its CSA-like User Friendly Option, requires a user to set up a "help desk" to help reduce the number of calls going to CDC.

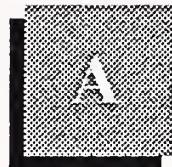
TPMs trying to "outdo" IBM will also find themselves at the additional disadvantage of being unable to retrieve lost revenues in other areas, since so much TPM emphasis is on hardware maintenance. Few TPMs have expanded their support offerings into such areas as software support (again, CDC is the exception here), training, and professional services (e.g.. consulting, network planning and management, performance optimization, and systems integration). TPMs will find themselves hurt further by inevitable hardware maintenance price cuts by continuing to focus primarily on hardware maintenance activities.

TPMs need to resist the temptation to view their service business as a simple process of counting boxes and pricing their service low enough to win over enough of those boxes, and instead should focus on meeting the challenge voiced by a growing percentage of users – total system support, including software and telecommunications products, provided in such a way that not only reduces downtime caused by system failure, but also improves the performance of the system. By doing so, TPMs will move away from the role of "hardware maintainer" toward the eventual goal of "site manager," and away from service areas where price sensitivity is shrinking margin growth into support areas of greater revenue and profit potential.



Appendix: Definitions

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Appendix: Definitions

Applications Software - Software that performs processing to service user functions.

Artificial Intelligence - The academic discipline involving the study of the processes by which humans perceive and assimilate data (and use reasoning to process this data) for the purpose of duplicating these processes within computer systems. Also, this term refers to the computer systems that accomplish these duplicated processes.

BOC - Bell Operating Company.

Consulting - Includes analysis of user requirements and the development of a specific action plan to meet user service and support needs.

Dispatching - The process of allocating service resources to solve a support-related problem.

Divestiture - The action, stemming from antitrust lawsuits by the Department of Justice, which led to the breakup of AT&T and its previously owned local operating companies.

Documentation - All manuals, newsletters, and text designed to serve as reference material for the ongoing operation or repair of hardware or software.

End User - May buy a system from the hardware supplier(s) and do own programming, interfacing, and installation. Alternatively, may buy a turnkey system from a systems house or hardware integrator.

Expert Systems Applications - Applications for expert systems—a computer system based on a data base created by human authorities on a particular subject. The computer system supporting this data base contains software that permits inferences based on inquiries against the

information contained in the data base. Expert systems is often used synonymously with "knowledge-based systems," although this latter term is considered to be broader and to include expert systems within its scope.

Engineering Change Notice (ECN) - Product changes to improve the product after it has been released to production.

Engineering Change Order (ECO) - The follow-up to ECNs that include parts and a bill of material to effect the change in hardware.

Escalation - The process of increasing the level of support when and if the field engineer cannot correct a hardware or software problem within a prescribed amount of time, usually two to four hours for hardware.

Fiber Optics - A transmission medium which uses light waves.

Field Engineer (FE) - For the purpose of this study, field engineer, customer engineer, service person, and maintenance person were used interchangeably and refer to the individual who responds to a user's service call to repair a device or system.

Field Service Management System (FSMS) - A specialized application program that automates some (if not all) of the following activities of a field service organization: call handling, dispatching, parts inventory and tracking, billing, efficiency reporting, and other functions. Ideally, the system accesses one data base from which each function can use and modify data.

Hardware Integrator - Develops system interface electronics and controllers for the CPU, sensors, peripherals, and all other ancillary hardware components. May also develop control system software in addition to installing the entire system at the end-user site.

ISDN - Integrated Services Digital Network. A proposed standard for digital networks providing transport of voice, data, and image using a standard interface and twisted pair wiring.

LADT - Local Area Data Transport. Data communications provided by the BOCs within local access transport areas (LATA).

Large System - Refers to traditional mainframes including at the low end IBM 4300-like machines and at the high end IBM 308X-like machines. Large systems have a maximum word length of 32 bits and a standard configuration price of \$350,000 and higher.

Mean Time Between Failures (MTBF) - The elapsed time between hardware failures on a device or a system.

Mean Time to Repair - The elapsed time from the arrival of the field engineer on the user's site until the device is repaired and returned to the user for his utilization.

Mean Time to Respond - The elapsed time between the user placement of a service call and the arrival at the user's location of a field engineer.

Microcomputer - A microprocessor-based single- or multi-user computer system typically priced less than \$15,000. A typical configuration includes an 8- or 16-bit CPU, monitor, keyboard, two floppy disk drives, and all required cards and cables.

Minicomputer - See Small System.

Operating System Software (Systems Software) - Software that enables the computer system to perform basic functions. Systems Software, for the purposes of this report, does not include utilities or program development tools.

PBX - Private Branch Exchange. A customer premises telephone switch.

Peripherals - Includes all input, output, and storage devices, other than main memory, which are locally connected to the main processor and are not generally included in other categories, such as terminals.

Planning - Includes the development of procedures, distribution, organization, and configuration of support services. For example, capacity planning, "installation" planning.

Plug-Compatible Mainframe (PCM) - Mainframe computers that are compatible with and can execute programs on an equivalent IBM mainframe. The two major PCM vendors at this time are Amdahl and National Advanced Systems.

Professional Services - A category services including system design, custom programming, consulting, education, and facilities management.

RBOC - Regional Bell Operating Company. One of seven holding companies coordinating the activities of the BOCs.

Remote Diagnostics - Gaining access to a computer from a point physically distant from the computer in order to perform problem determination activities.

Remote Support Implementation - An extension of remote diagnostics where some level of support delivery is performed from a point physically distant from the computer. Currently, this capability is more common to software support where problems can be solved or circumvented through downline loading of new code (fixes).

Reseller - A marketing organization which buys long-distance capacity for others at wholesale rates, selling services at retail but discounted prices and profiting on the difference.

Small Business Computer - For the purpose of this study, a system which is built around a Central Processing Unit (CPU), has the ability to utilize at least 20M bytes of disk capacity, provides multiple CRT workstations, and offers business-oriented systems software support.

Small System - Refers to traditional minicomputer and superminicomputer systems ranging from a small multi-user, 16-bit system at the low end to sophisticated 32-bit machine at the high end.

Software-Defined Network - A private network which uses public network facilities and which is configurable on an as-needed basis by the user (see Virtual Private Network).

Software Engineer (SE) - The individual who responds (either on-site or via remote support) to a user's service call to repair or patch operating systems and/or applications software.

Software Products - Systems and applications packages which are sold to computer users by equipment manufacturers, independent vendors, and others. Also included are fees for work performed by the vendor to implement a package at the user's site.

Superminicomputer - See Small System.

Systems Integration - The action of a single service vendor's design, development, and implementation of a system or subsystem including integration of hardware, software, and communications facilities for a customer.

System Interruption - Any system downtime requiring an Initial Program Load (IPL).

Systems House - Integrates hardware and software into a total turnkey system to satisfy the data processing requirement of the end user. May also develop systems software products for license to end users.

T-1 - Refers to a standard 1.544 megabit per second digital channel used between telephone company central offices and now used for microwave, satellite, fiber optics, or other bypass applications.

Third-Party Maintenance (TPM) - Any service provider other than the original equipment vendor.

Training - All audio, visual, and computer-based documentation, materials, and live instruction designed to educate users and support personnel in the ongoing operation or repair of hardware and software.

Turnkey System - Composed of hardware and software integrated into a total system designed to completely fulfill the processing requirements of a single application.

VSAT - Very Small Aperture Terminal. A small satellite dish system, usually using Ku-band frequencies.

Virtual Private Network - A portion of a public network dedicated to a single user.

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